NEURAL NETWORK BOT

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Abstract - *The most commonly known assistant which digitally interacts is the Chat bot which uses a technology for interaction between the human and the computers, this project has a bot based on neural networking and trained for analysing the queries of the users and simultaneously analysing the emotions of the user since emotions play a crucial part in analysis and to provide proper response. These maybe in the form of speech, gesture or signs , Moreover with the increased usage of messenger or texting applications, emotions from the text is extracted. Specially targeting youngsters who are feeling low. these Bots play the role of good companion ,creating a strong relationship between the users and the bot and even moving a step further provide suggestions and help the users*

***Key Words*:** Chatbot, emotion recognition, neural network, Natural Language processing.

1. INTRODUCTION

In simple terms Chatbot can be termed as software/programs that can interact, communicate with human beings and respond using natural language processing and neural network. As a conversational partner, algorithms convincingly simulate humans beings .These simulated programs so called chatbots are classifies into two fairly based on their response mechanism and training. The First category of chatbot comes under those bots that respond and process the queries based on the a fore mentioned set of training examples and rules, hence these are bound to some extent hence called as retrieval based.

Second type of bot is the one dynamic in nature and adapts and learns as time progresses, so called as generative bots. These are further classified as:

- Open domain with retrieval-based responses

- Open domain with generative-based responses

- Closed domain with retrieval-based responses

- Closed domain with generative-based responses

Machine and human interaction has been done through a process called the natural language processing and few example of bots that are contemporary which use such processing are Siri, cortona, allo etc.

Speaking of emotions and life ,emotions are an integral part of life or can be termed as life itself in some cases since they are found to have an impact on various aspects namely thoughts, inspiration, , imagination, focus, , experiences which cumulatively influence the behaviour and decisions of a person.

Our project and approach is focused on casual interactions with users using the bot, users often show a wide range of emotions, such as being nervous about studying, being desperate for a new career, feeling depressed about wanting to break up, etc. Understanding these emotions and developing an emotionally attentive approach enable a deep sustaining relationship with users and to know their emotional desires. Many students are turning to the Internet to release their negative feelings, and it is shown to have positive effects on loneliness, depression, and stress. Numerous youngsters especially students and fresh job seekers are going to the Internet to deliver their gloomy sentiments, and it is displayed to emphatically affect dejection, sadness, and stress.

In reality this bot can be called as a virtual friend to them who want a friend in deed but can't express open heartedly to the real world but want to express irrespective of what can have this bot as a companion, wherein the bot poses few questions and interacts to understand the emotions and problem of the clients/users purely based on the chat interaction between the bot and the user using the following modules specified in

2. Modules Description

A.   Random:

This is a Built-in module of python and can be used to generate random numbers or perform actions such as printing a random value in case of a string or structured on or unstructured structured list. Basically it generates or creates random numbers.

B.   Json

Primarily Json is a Built-in function to work with Json data in python. Json is an open standard file format at the same time it is an interchangeable format too. It consists of data objects carrying the pair and even the data type.

C. Pickle

This Pickle module deals with conversion of python objects structures into binary form, that is it converts objects such as list dictionary etc. Into 0s and 1s which is known as serializing and de serializing. Objects are converted into a stream of bytes known as character stream.

D. Sys

This module is about the runtime environment of python, providing information and detailing about methods, functions and various constants related to the interpreter which manipulates the environment and maintains the functions interacting with them.

E. Numpy

Numpy abbreviated as numerical python deals with various arrays multidimensional in nature and the collection for processing the same. Different domains such as linear algebra and matrices can be performed; even logical operations and mathematical operations can be performed on the arrays. This enables efficiency when dealing the logic and mathematics in terms of arrays especially.

F. NLTK

NLTK module is a toolkit for natural language processing that is it makes natural language understandable to machines. Generally the inputs or the text given is in high level language which is not machine understandable such unstructured data is converted using the NLTK known as pre-processing . This pre-processing becomes much easier with NLTK as it has a large number of libraries and even provides data sets which can be used for testing.

G. Tensorflow

Tensorflow is an accumulation of tools, libraries and resources for the usage of community which is dynamic with different ecosystems .This module was created for machine learning processes and is open sourced for model training and easy debugging which makes execution easier and intuitive. Tensor flow is not language restricted and can be deployed and adapted to any system making production a lot easier.

It helps in the creation of deep learning models for efficient and fast paced computing ability especially in case of numerical.

H. Speech recognition

Speech recognition in python is a module which identifies the spoken words in and modifies them into text making it machine understandable and process able. In simple terms it allows the software to acquire input from the Mic and analyses it, processes it and provides a suitable response.

Moreover speech recognition supports several search engines and API

I. Pywhatkit

Pywhatkit library is a type of automation module, especially for automation of messages in WhatsApp. It simplifies sending messages using a minimal code written in python. Pywhatkit is popular because of its user friendly set up and easy to use library functions and features.

Not just messaged but even other media such as playing YouTube videos, sending mails, sending imaged and files can be done through this.

J. LRU CACHE

The functools module has the LRU cache, this tools uses memorization as a technique in order to reduce the time of execution to a minimum, making the application faster in processing. LRU cache keeps track of all the bits and maintains the least used bits or data, known as optimization of data helping to the full computational ability of the program or computer.

K. Pyttsx3

This Is a library function of python ,this library function is used for conversion of text to speech that is it converts the data typed into a voice audible as human.

The program converts into audible voice either male or female voice, a unique feature of this library is that it works even when there is no internet connectivity i.e offline.

L. Selenium

This Selenium is a test driver in python used for automation which is the scripts related to browsers are automated. The interaction with web browsers such as chrome, Firefox etc. are made easy and efficient through API.

It is a testing tool wherein it converts the test cases provided into scripts for automation which is quite flexible and supports multiple operating systems and languages.

M. Lemmatizer

Lemmatizer is a module in the NLTK library, used for natural language processing. This process of lemmatization involves grouping of similar kinds of words into one item for better understanding since they group the words having relatively similar meaning and structure.

N. Pyaudio

Pyaudio is a module that can be used across different platforms for input/output library. This module helps in recording and playing different types of audio in platform.

O.   Matplotlib

Matplotlib is a multi-platform library used for visualization of data into arrays for 2d plotting. It creates plots which maybe static or animated making easier data visualization and analysis.

P.   Seaborn

This Seaborn is a python library used for high level of data visualization and is used on top of Matplotlib. Exploratory data analysis in terms of graphs is done through this by drawing graphs that are informative for data analysis. Randomly distributed data is analysed and graphs are drawn through Seaborn.

3. INPUT AND OUTPUT

Input is taken from the user in the form of speech, facial recognition that is in the form of picture or in the video format and analysed. Based on this input received the bot tries to analyse the scenario and condition and emotional state of the client or the user and gives output based on the same as suggestions such as encouraging to read a book suggested ,music recommendation, movie recommendation or some suggestive measures.

4. ARCHITECTURE

The architecture shown in figures 1 and 2 represent the various logical steps in the natural language processing and the steps involved in the training of dataset and usage of Json file for the same which forms the crux of the neural bot implementation.

The Feed forward model is adopted and the data that is encoded is used in the training stage, a number of input layers, hidden layers and output layers are created in accordance to training data forming the neural network. This is called the Natural language Pre-processing which includes Tokenization, Stemming/Lemmatization, and Regex Extraction.
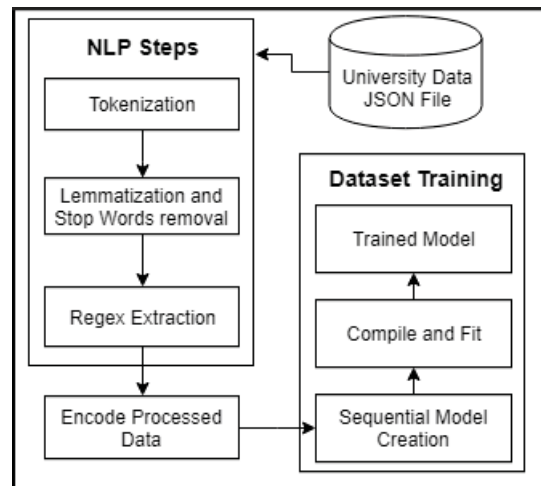
After the pre-processing stage the interface moves to the prediction phase where the different queries of the user/client are taken. Querying is done using UI and forwarded to the query pre-processing stage wherein the queries are encoded and passed on to the processing and prediction stage. In this stage the queries are analysed decoded and gives back the suitable or appropriate suggestions based on the query to the user.
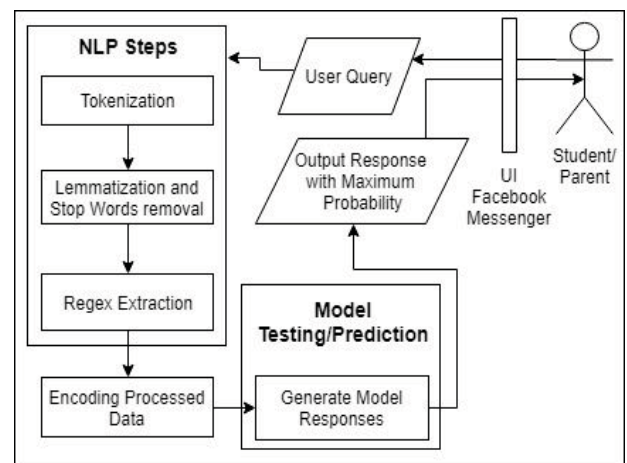
5. CONCLUSION AND OUTPUT

This paper has shown how neural networking using tensor flow and other modules in python suitably can be used to build a neural network bot that takes input from the user in the form of text such as messaging and interaction with the bot, speech and video or picture. The main agenda of this bot was to take the inputs from the people especially from the younger peers such as students or the young working class prone to different traumatic situations and those who do not want to share or can't share their feelings with ease, this bot serves as a virtual companion and helps by taking the various inputs, analysing the mood and provides the necessary feedback.

This bot can be further enhanced by integrating the social media accounts of the user taking their consent and dynamically analyse the mood of the person at regular intervals and provide futuristic suggestions based on the mood of the person to cheer up the user such as movie, music, book, restaurant or even provide suggestions to talk to necessary people in utmost necessity. In future in this growing social media having been showing the signs of least interaction among people and this needs to be taken care. Hence this bot can be upgraded to bring out the human nature and basic human traits such as being social, interacting etc. Not just restricting it to an application this can be integrated and made cross platform application

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